ICF-28

SERVICE MANUAL

Ver 1.1 1998. 09

AEP Model
UK Model
E Model
Australian Model

SPECIFICATIONS

Frequency range:
Eastern Europe
FM: 65 – 108 MHz
AM: 530 – 1710 kHz
Other countries
FM: 87.5 – 108 MHz
AM: 530 – 1710 kHz
Speaker:
Approx. 7.7 cm (3 inches) dia., 4 ohms
Power output:
350 mW (at 10% harmonic distortion)
Output: Ω (headphones) jack (minijack)
Power requirements:
With the supplied AC power cord: 220 – 230 V AC, 50 Hz
With four R6 (size AA) batteries: 6V, DC
Dimensions:
Approx. 216 × 131.5 × 80.5 mm (w/h/d)
(8 1/2 × 5 3/16 × 3 3/16 in.) incl. projecting parts with the carrying handle pushed in.
Mass: Approx. 700 g (1lb 9 oz.) incl. batteries
Supplied accessory: AC power cord (1)
(EXCEPT Argentina)

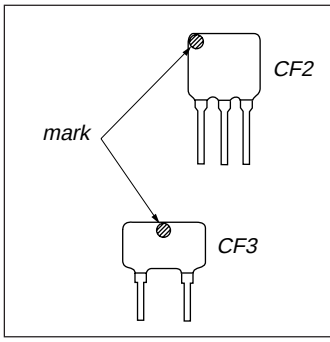
Design and specifications are subject to change without notice.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

HOW TO CHANGE THE CERAMIC FILTERS

This model is used two ceramic filters of CF2 and CF3.
You must used same type of color marked ceramic filters in order to meet same specifications.
Therefore, the ceramic filter must changed two pieces together since it's supply two pieces in one package as a spare parts.



Mark	Center frequency
red	10.70 MHz
blue	10.67 MHz
orange	10.73 MHz
black	10.64 MHz
white	10.76 MHz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

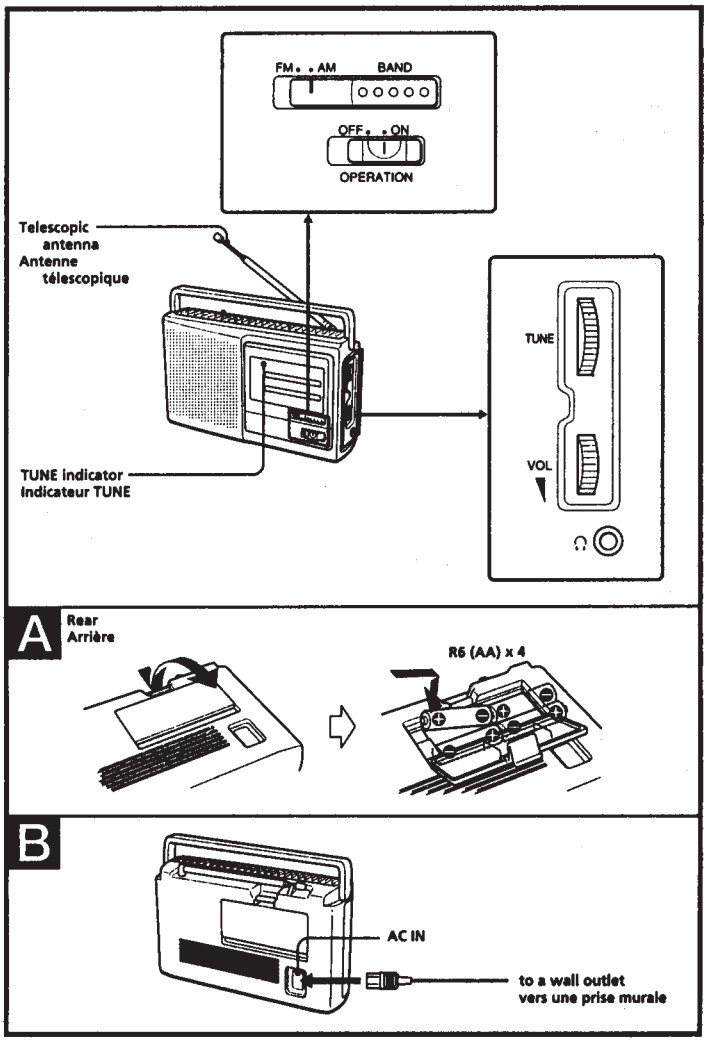
FM/AM RADIO

MICROFILM

SONY®

This section is extracted from instruction manual.

SECTION 1
GENERAL



WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

Before You Begin

Thank you for choosing the Sony 2 BAND RADIO ! This unit will give you many hours of reliable service and listening pleasure.
Before operating the unit, please read these instructions thoroughly and retain them for future reference.

Features

- 2 way power AC/DC operation.
- **TUNE** indicator which lights during radio reception.
- Carrying handle.

Precautions

- Operate the unit on 6 V DC or 220-230 V AC, 50Hz.
  For battery operation, use four R6 (size AA) batteries.
  For AC operation, use the supplied AC power cord. Do not use any other type.
- When the internal batteries are not being used, remove them to avoid damage caused by battery leakage and corrosion.
- The nameplate indicating operating voltage, etc. is located on the rear exterior.
- To disconnect the power cord, pull it out by the plug, not the cord.
- The unit is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the unit itself is turned off.
- Do not leave the unit near heat sources, or in a place subject to direct sunlight, excessive dust, or mechanical shock.
- Should any solid object or liquid fall into the unit, disconnect the AC power cord or remove the batteries, and have the unit checked by qualified personnel before operating it any further.
- Since a strong magnet is used for the speaker, metallic objects such as pins, etc. may cling to the unit. Keep personal credit cards using magnetic coding or spring-wound watches away from the unit to prevent possible damage from the magnet.
- When the casing becomes soiled, clean it with a soft cloth dampened with mild detergent solution. Never use abrasive cleansers or chemical solvents, as they may mar the casing.
- In vehicles or in buildings, radio reception may be difficult or noisy. Try listening near a window.
- Keep the radio away from metallic objects.

Battery Warning

When the unit is left unplugged for a long time, remove the batteries to avoid undue battery discharge and damage to the unit from battery leakage.

If you have any questions or problem concerning your unit , please consult the nearest Sony dealer.

Choosing Power Sources

Batteries (See Fig. A)

1 Open the lid of the battery case.
2 Insert four R6 (size AA) batteries (not supplied) with correct polarity.
3 Close the lid.

Battery life

Using Sony batteries R6 (size AA)
Approx. 26 hours
(for four hours a day at normal volume using Sony batteries)

Replacing batteries

When the sound becomes weak or distorted, replace all the batteries with new ones.

Notes on batteries

- Insert the batteries with correct polarity.
- Do not charge the dry batteries.
- Do not use different types of batteries at the same time.
- When you replace the batteries, replace all with new ones.
- When the unit is not being used for a long period of time, remove the batteries to avoid damage from battery leakage and corrosion.
- If a battery leakage occurs, wipe the battery compartment with a soft cloth before inserting new ones.

House Current (See Fig. B)

1 Connect the AC power cord (supplied) to the **AC IN** jack of the radio.
2 Plug into a wall outlet.

Operating the Radio

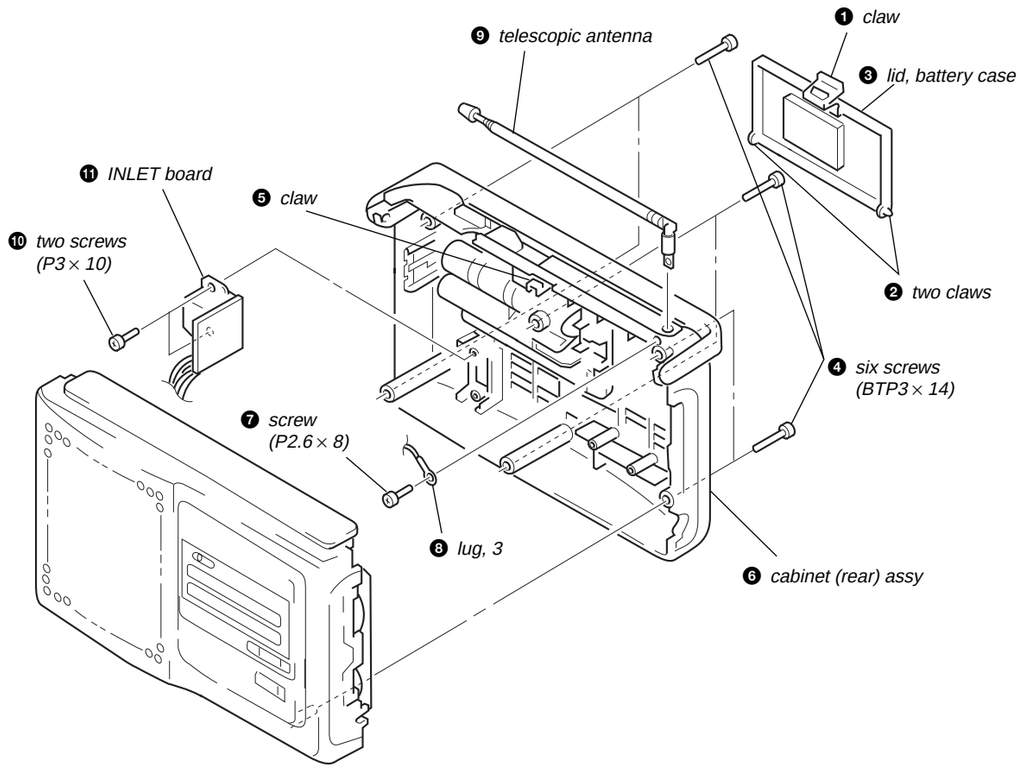
1 Slide **OPERATION** to **ON** to turn on the radio and adjust **VOL** (volume).
2 Select **FM** or **AM** using **BAND** and tune in a station using **TUNE** (tuning).
TUNE (tuning) indicator lights up when a station is tuned in.

- To turn off the radio, slide **OPERATION** to **OFF**.
- To improve radio reception
  FM: Extend the telescopic antenna and adjust the length, direction and the angle for best reception.
  AM: Rotate the unit horizontally for optimum reception. A ferrite bar antenna is built in the unit.
- ∩ (headphones) jack (right side of rear cabinet)
  When an optional accessory headphones is plugged into the headphones jack, it automatically silences the radio speaker and the listener can enjoy complete privacy. The jack is designed to be used for the stereo headphones with your monaural radio, but reception will be heard in monaural only.

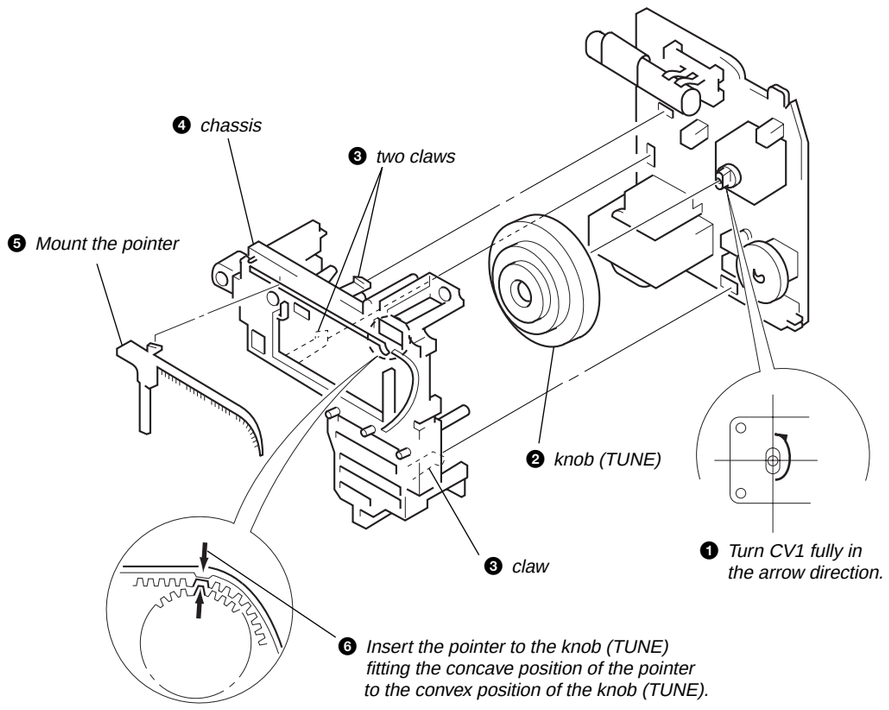
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

CABINET (REAR) ASSY



POINTER SETTING


❹ chassis
❸ two claws
❺ Mount the pointer
❷ knob (TUNE)
❸ claw
❶ Turn CV1 fully in the arrow direction.
❻ Insert the pointer to the knob (TUNE) fitting the concave position of the pointer to the convex position of the knob (TUNE).

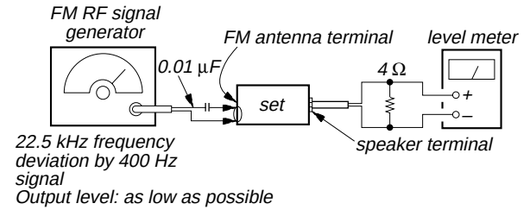
SECTION 3
ELECTRICAL ADJUSTMENTS

0 dB = 1µV

[FM]

Setting:

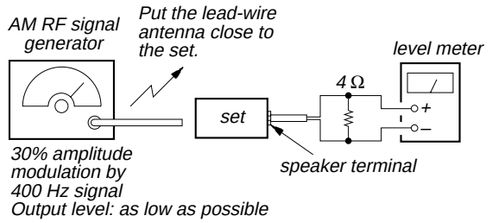
Band switch: FM



[AM]

Setting:

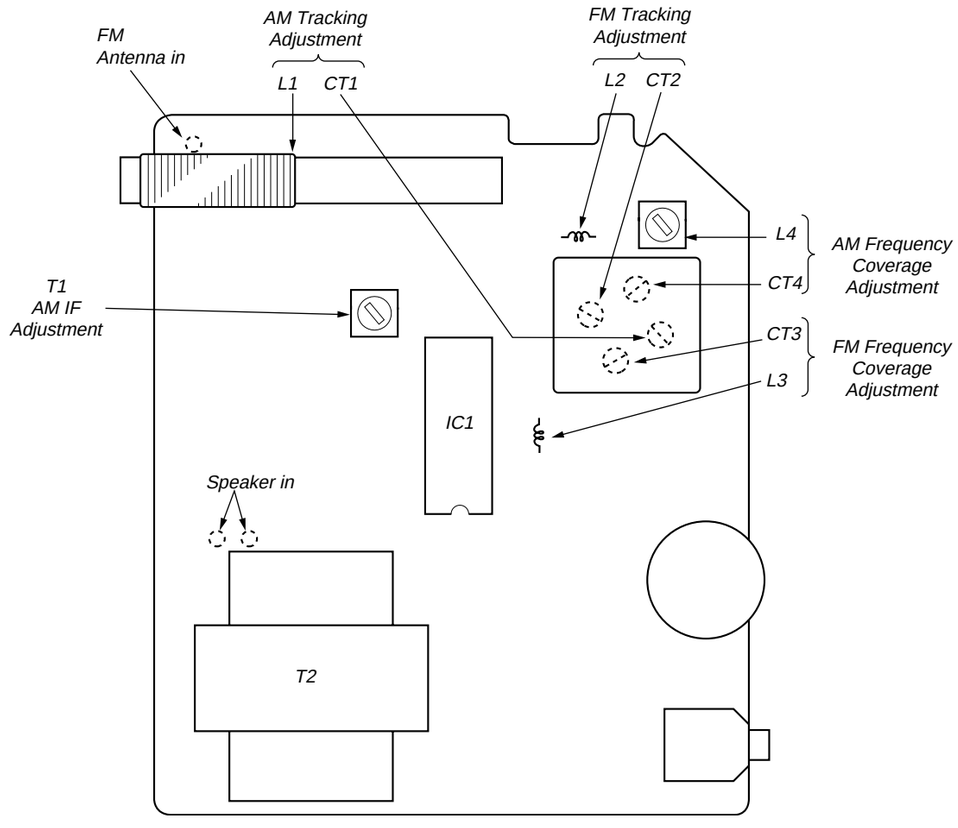
Band switch: AM



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.
- Remove FM antenna in FM adjustments.

Adjustment Location:

[MAIN board] (Component Side)



FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L3	86.5 MHz (64.0MHz)
CT3	109.5 MHz

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L2	86.5 MHz (64.0MHz)
CT2	109.5 MHz

AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L4	520 kHz
CT4	1,750 kHz

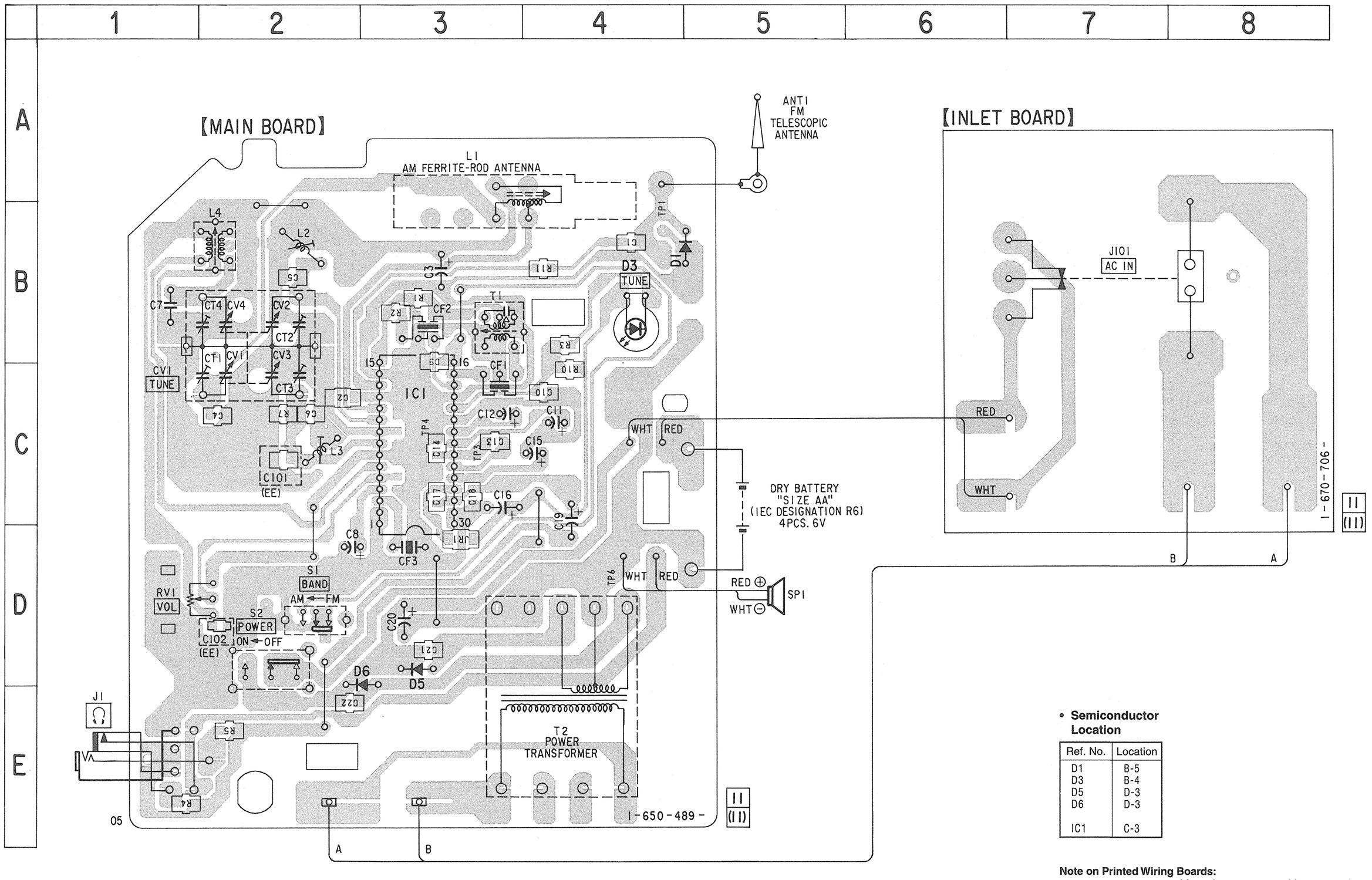
AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L1	600 kHz
CT1	1,400 kHz

AM IF ADJUSTMENT	
Adjust for a maximum reading on level meter.	
T1	455 kHz

( ): East European model

SECTION 4
DIAGRAMS

4-1. PRINTED WIRING BOARDS



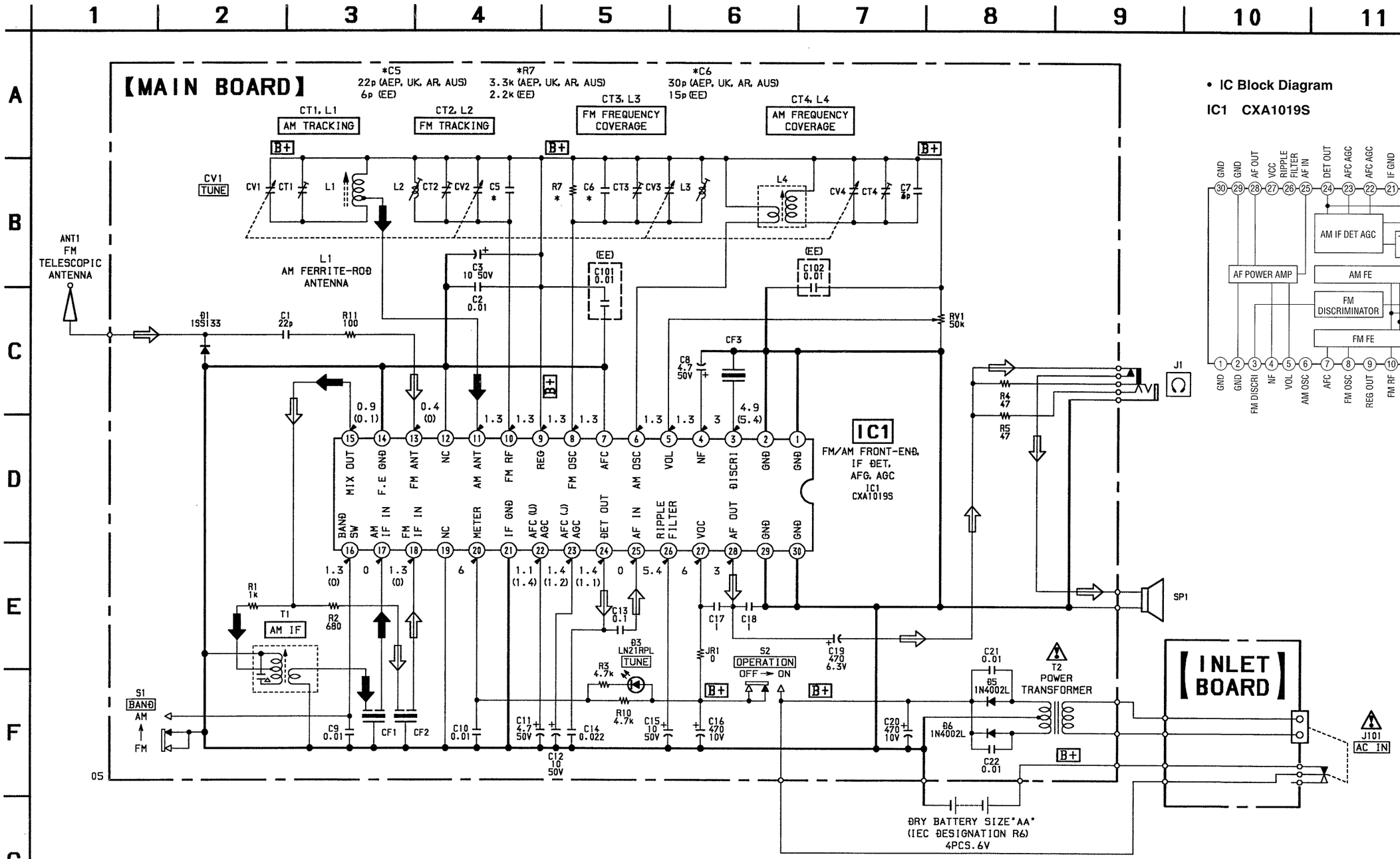
- **Semiconductor Location**

Ref. No.	Location
D1	B-5
D3	B-4
D5	D-3
D6	D-3
IC1	C-3

Note on Printed Wiring Boards:

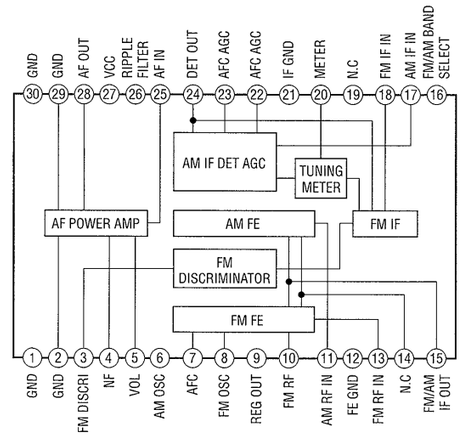
- ○—— : parts extracted from the component side.
- △ : internal component.
- ▒▒ : Pattern from the side which enables seeing.
- Abbreviation
  EE : East European model.

4-2. SCHEMATIC DIAGRAM



• **IC Block Diagram**

IC1 CXA1019S



Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- ▭ : panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- B+ : B+ Line.

- Voltages are dc with respect to ground under no-signal (detuned) conditions.
  no mark : FM
  ( ) : AM
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM
  ➡ : AM
- Abbreviation
  AR : Argentina model.
  AUS : Australian model.
  EE : East European model.

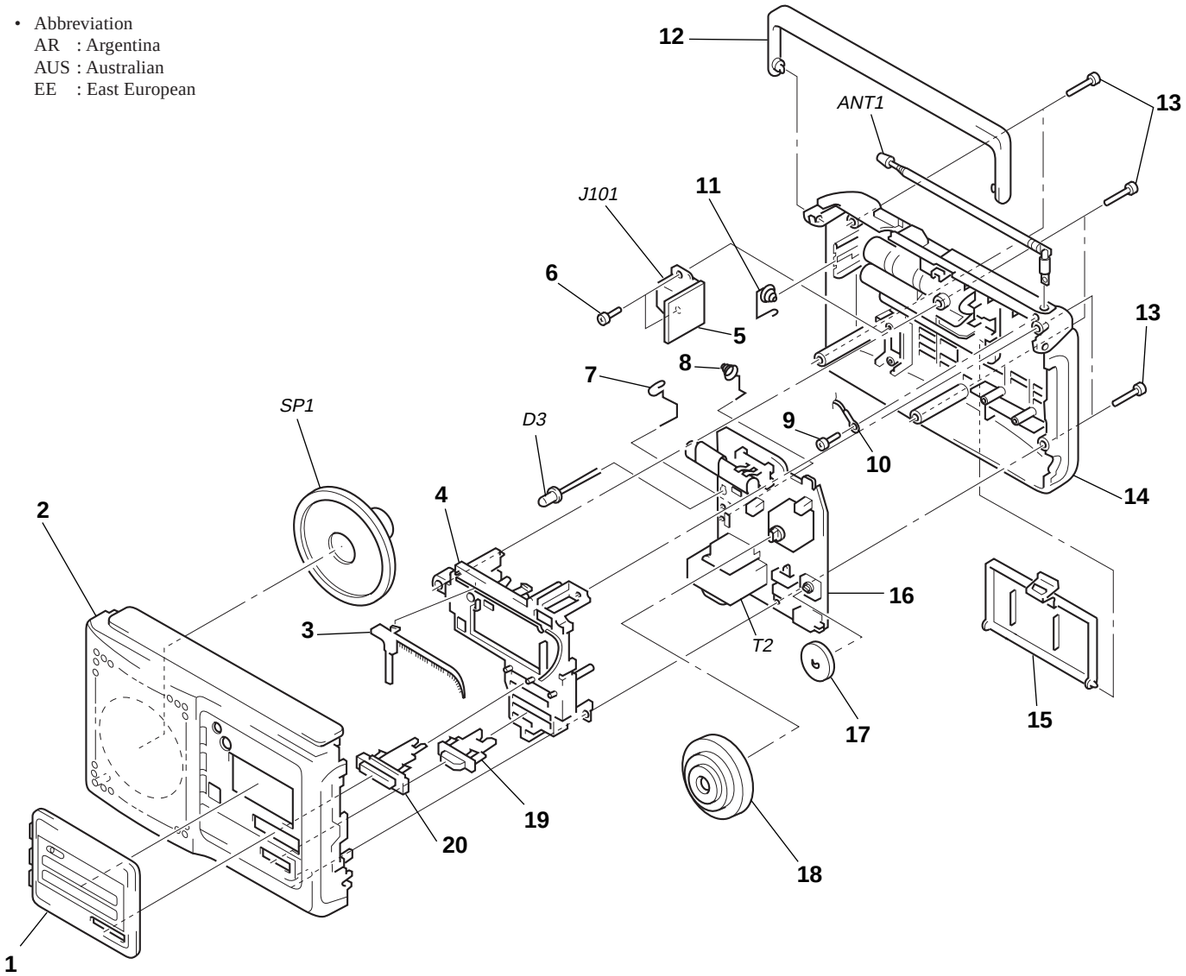
SECTION 5
EXPLODED VIEW

NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color

- Abbreviation
  AR : Argentina
  AUS : Australian
  EE : East European

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of the electrical parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.



Ref. No.	Part No.	Description	Remark
1	3-026-251-01	SCALE, DIAL	
2	3-026-249-01	CABINET (FRONT)	
3	3-908-109-11	POINTER	
* 4	3-908-107-02	CHASSIS	
* 5	1-670-706-11	INLET BOARD	
6	7-685-647-79	SCREW +P 3X10 TYPE2 NON-SLIT	
* 7	3-908-115-01	TERMINAL (+), BATTERY	
* 8	3-908-116-01	SPRING (–), BATTERY COIL	
9	7-685-134-19	SCREW +P 2.6X8 TYPE2 NON-SLIT	
10	7-623-508-01	LUG, 3	
11	3-029-028-01	TERMINAL (+/–), BATTERY	
* 12	3-908-130-01	HANDLE	
13	7-685-549-11	SCREW +BTP 3X14 TYPE2 N-S	

Ref. No.	Part No.	Description	Remark
14	3-026-250-01	CABINET (REAR)	
15	3-026-252-01	LID, BATTERY CASE	
* 16	A-3683-007-A	MAIN BOARD COMPLETE (AEP, UK, AR, AUS)	
* 16	A-3683-008-A	MAIN BOARD COMPLETE (EE)	
17	3-908-111-01	KNOB (VOL)	
18	3-908-110-01	KNOB (TUNE)	
19	3-026-254-01	KNOB (POWER)	
20	3-026-253-01	KNOB (BAND)	
ANT1	1-501-222-81	ANTENNA, TELESCOPIC (FM)	
D3	8-719-042-69	LED LN21RPL (TUNE)	
J101	1-526-838-11	INLET, AC 2P	
SP1	1-544-518-11	SPEAKER	
⚠T2	1-450-324-21	TRANSFORMER, POWER	

INLET **MAIN**

SECTION 6
ELECTRICAL PARTS LIST

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable

- Abbreviation
  AR : Argentina
  AUS : Australian
  EE : East European

- Items marked "*" are not stocked since they are seldom required for routine service.
  Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA. . : µA. . uPA. . : µPA. .
  uPB. . : µPB. . uPC. . : µPC. .
  uPD. . : µPD. .
- CAPACITORS
  uF: µF
- COILS
  uH: µH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			
*	1-670-706-11	INLET BOARD			
		**********			
		< AC INLET >			
⚠J101	1-526-838-11	INLET, AC 2P (AC IN)			
**********					
*	A-3683-007-A	MAIN BOARD, COMPLETE (AEP, UK, AR, AUS)			
*	A-3683-008-A	MAIN BOARD, COMPLETE (EE)			
		**********			
*	1-535-771-11	TERMINAL			
		< CAPACITOR >			
C1	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C2	1-163-059-91	CERAMIC CHIP	0.01uF	10%	50V
C3	1-124-907-11	ELECT	10uF	20%	50V
C5	1-163-089-00	CERAMIC CHIP	6PF		50V (EE)
C5	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
					(AEP, UK, AR, AUS)
C6	1-163-097-00	CERAMIC CHIP	15PF	5%	50V (EE)
C6	1-163-104-00	CERAMIC CHIP	30PF	5%	50V
					(AEP, UK, AR, AUS)
C7	1-102-936-00	CERAMIC	3.0PF	0.25PF	50V
C8	1-126-963-11	ELECT	4.7uF	20%	50V
C9	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V
C10	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C11	1-126-963-11	ELECT	4.7uF	20%	50V
C12	1-124-907-11	ELECT	10uF	20%	50V
C13	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C14	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C15	1-124-907-11	ELECT	10uF	20%	50V
C16	1-124-472-11	ELECT	470uF	20%	10V
C17	1-164-346-11	CERAMIC CHIP	1uF		16V
C18	1-164-346-11	CERAMIC CHIP	1uF		16V
C19	1-126-941-11	ELECT	470uF	20%	6.3V
C20	1-124-472-11	ELECT	470uF	20%	10V
C21	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C22	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C101	1-163-031-11	CERAMIC CHIP	0.01uF		50V (EE)
C102	1-163-031-11	CERAMIC CHIP	0.01uF		50V (EE)

Ref. No.	Part No.	Description			
		< CERAMIC FILTER >			
CF1	1-577-072-11	FILTER, CERAMIC			
CF2	1-760-144-61	FILTER, CERAMIC			
CF3	1-760-144-61	FILTER, CERAMIC			
		< VARIABLE CAPACITOR >			
CT1-4	1-151-631-11	CAP, VARIABLE (AEP, UK, AR, AUS)			
CT1-4	1-151-633-11	CAP, VARIABLE (EE)			
CV1-4	1-151-631-11	CAP, VARIABLE (TUNE) (AEP, UK, AR, AUS)			
CV1-4	1-151-633-11	CAP, VARIABLE (TUNE) (EE)			
		< DIODE >			
D1	8-719-991-33	DIODE 1SS133T-77			
D3	8-719-042-69	LED LN21RPL (TUNE)			
D5	8-719-031-85	DIODE 1N4002L			
D6	8-719-031-85	DIODE 1N4002L			
		< IC >			
IC1	8-752-037-02	IC CXA1019S			
		< JACK >			
J1	1-566-891-11	JACK (🎧)			
		< SHORT >			
JR1	1-216-296-00	SHORT	0		
		< COIL >			
L1	1-402-464-11	ANTENNA, FERRITE-ROD (MW)			
L2	1-428-104-11	COIL, AIR-CORE (EE)			
* L2	1-428-274-11	COIL, AIR-CORE (AEP, UK, AR, AUS)			
L3	1-402-654-11	COIL, AIR-CORE (EE)			
L3	1-428-222-11	COIL, AIR-CORE (AEP, UK, AR, AUS)			
L4	1-406-028-00	COIL, OSC (MW)			
		< RESISTOR >			
R1	1-216-049-11	RES,CHIP	1K	5%	1/10W
R2	1-216-045-00	METAL CHIP	680	5%	1/10W
R3	1-216-065-00	RES,CHIP	4.7K	5%	1/10W
R4	1-216-017-00	RES,CHIP	47	5%	1/10W
R5	1-216-017-00	RES,CHIP	47	5%	1/10W

Ref. No.	Part No.	Description			Remark
R7	1-216-057-00	RES,CHIP	2.2K	5%	1/10W (EE)
R7	1-216-061-00	METAL CHIP	3.3K	5%	1/10W (AEP, UK, AR, AUS)
R10	1-216-065-00	RES,CHIP	4.7K	5%	1/10W
R11	1-216-025-00	RES,CHIP	100	5%	1/10W
		< VARIABLE RESISTOR >			
RV1	1-225-441-11	RES, VAR, CARBON 50K (VOL)			
		< SWITCH >			
S1	1-571-478-11	SWITCH, SLIDE (BAND)			
S2	1-692-843-11	SWITCH, SLIDE (OPERATION)			
		< TRANSFORMER >			
T1	1-404-790-11	TRANSFORMER, IF			
⚠T2	1-450-324-21	TRANSFORMER, POWER			
**********					
		MISCELLANEOUS			
		**********			
ANT1	1-501-222-81	ANTENNA, TELESCOPIC (FM)			
SP1	1-544-518-11	SPEAKER			
**********					
		ACCESSORIES & PACKING MATERIALS			
		**********			
⚠	1-751-115-11	CORD, POWER (UK)			
⚠	1-769-412-11	CORD, POWER (AEP, EE, AUS)			
	3-862-928-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, GERMAN, SPANISH)			
	3-862-928-21	MANUAL, INSTRUCTION (DUTCH, POLISH, RUSSIAN)			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-924-934-12

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Personal A&V Products Company

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